HELSINKI UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND COMMUNICATIONS ENGINEERING

NETWORKING LABORATORY

PLAYER INSTRUCTIONS

VERSION 1.1
04.04.2005

MOBILE OPERATOR BUSINESS GAME

MOB

1. Introduction

1.1 Generally About Business Games

Active and problem-based learning has increased its popularity rapidly. This is mainly due to some new ideas on how people actually learn (Töyli, 2001). Business games as a mean of learning, promote the idea of "learning by doing", and they have become very popular and important teaching tools. In this player instruction report, the terms simulation (or teaching simulation) and business game are considered as synonyms.

The following Chinese proverb highlights the philosophy behind simulations and business games quite well: (Töyli 2001)

> *I hear and I forget*
>
> *I see and I remember*
>
> *I do and I understand*

It can be stated that a simulation is a media to provide "learning by experiment" and "learning by doing". In traditional teaching, students are passive recipients of information and are not assumed to contribute to the learning of each other. Simulations (business games) are, on the contrary, learner-directed: a situation or a problem is presented to the participants and they are encouraged to find a solution. Because of the nature of a business game, the views of many people are more easily considered. (Töyli, 2001)

In 1987 it was estimated that over 8755 instructors in over 1900 four-year business schools used simulations/games in their course work (Töyli, 2001 and Faria, 1987). In 1998 an update to the year 1987 study was made. The results of the update showed that usage of business games had increased in all fields studied (Töyli, 2001 and Faria, 1998).

The purpose of a business game is to provide students a summarizing overview of various subjects they have studied in the past. The key learning experience is seeing and applying many different theories in different fields and observing their linkages. The theories must be applied on somewhat superficial level in order to be able to give the summarizing learning experience with wide scope. (Kokko, 2004)

1.2 MOB Overview

The main objective of the Mobile Operator Business Game (MOB) is to familiarize the participants with today's mobile operator business, especially the Finnish one, and to gain a better understanding of it. Main emphasis is placed on customer-focused business thinking. It needs to be remembered that MOB can not exactly model the

mobile communications market, but it can hopefully mirror some events and phenomenon that might occur in it. MOB can, if thoroughly implemented, for example:

- Be used to analyze business constraints, dependencies, and possible futures of the mobile communications market;

- Help to gain better understanding of the mobile communications businesses;

- Improve teamwork skills;

- Be fun.

The teams' tasks in MOB are to price and promote various types of mobile services, e.g. consumer voice and corporate voice, SMS, MMS, cellular data, and WLAN data, and to make different kinds of necessary investments. Different kinds of investments are investments on e.g. marketing, customer acquisition and relations, human resource management, and research and development. All of these play an important role in the MOB-model. At this point of development the MOB-model models the teams as both network and service operators.

This chapter outlines the functionality of the Mobile operator business game from both the players' point of view and the facilitator's point of view. The facilitator is the person who runs the game session, the facilitator could also be thought of as the market power.

1.2.1 PARTICIPANTS' ROLES IN MOB

In MOB two to six teams can compete against each other. Each team represents a management board of a mobile operator. One game session is a sequence of seasons. One season equals one year. The maximum number of seasons is nine and the starting season is denoted as season 0. For each season teams make various decisions concerning: pricing of services, marketing, research and development, network maintenance, purchasing and human relationship management. These decisions are placed on excel sheets and delivered to the facilitator. At the beginning of each season the facilitator delivers a new market situation to the players and elaborates the new market situation verbally.

1.2.2 Structure of MOB

MOB is made out of two excel workbooks which are called "the player module" and "the facilitator module". Each team gets its own player module. Usually all the player modules are identical in the beginning of a session. This enables games with identical starting setting for all teams, but also more realistic settings where there is a market leader and challengers of different strengths. The facilitator module generates new market situations based on the teams' decisions. Generation of market situations is highly automated. However, if necessary, the facilitator can intervene to the parameterisation of

the game. He can also manipulate teams' decisions if necessary. Manipulation of results is of course recommended only in the case of clear unintentional input.

The information between the player modules and the facilitator module is transferred in text files. The structure and interaction between the different modules is illustrated in figure 1.
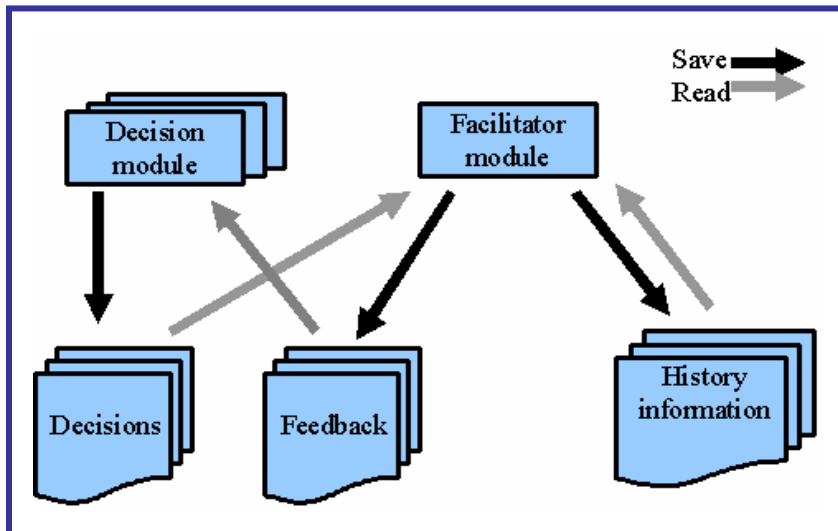

Figure 1: *The structure of MOB and the information flows between the different modules.*

In these player instructions only the structure of the player module will be described in more detail. The structure of the facilitator module will be described only very shortly.

1.2.3 The Structure of the Player Module

The decision making in the player module is distributed in the following manner:

- Offers for consumers;
    - Voice services;
    - Data services;
    - Messaging services.
- Offers for corporations;
- Offers for content providers (Not implemented yet!);
- Marketing;
- Research and development;
- Roaming, MVNO, and handsets (Not implemented yet!);
- Network maintenance;

- Purchasing;

- Human resources;

- Financing and cash flow statement (CFS);

- Income statement (IS) and balance sheet (BS).

Information directly related to the decision making is shown in the same window as the where the decisions are made. Teams can start the decision making from any of the decision parameters, but it could be easier to follow some kind of a predefined pattern, e.g. by going through the decisions in the same order as the buttons on each window (more on these in chapter 2). In addition to the decision making windows, the player module has separate windows for financial information, such as the income statement and the balance sheet, and a main window. The main window is where the decisions are saved and sent to the facilitator and the new generated market situations are retrieved. Figure 2 illustrates the data flow in the player module. Detailed information about the player module can be found in chapter 2.
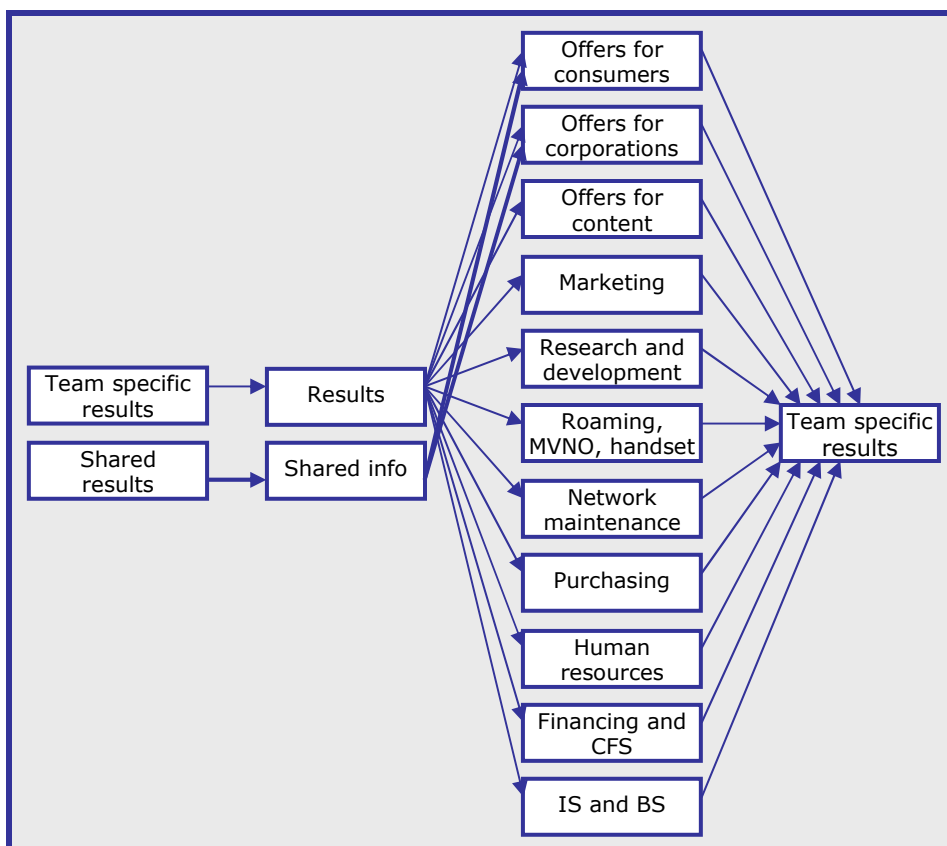
Figure 2: *The data flow in the player module.*

1.2.4 The Structure of the Facilitator Module

The generation of the new market situation in the facilitator module begins by reading in the decisions of all teams. The calculation of the new market situation is distributed in the same manner that the decision making is distributed in player module as showed in figure 2. The majority of the calculations give two basic results, the first is an index telling the success of the players' actions on a particular area, and the second is the cost incurred from the decisions.

1.2.5 Modeled Sub Games

MOB includes many different sub games which all are somewhat related to each other, but can be handled as separate entities. Decision-making regarding these sub games is in a more strategic level and can not be directly mapped to any decision fields. Teams should before the game session make a strategic business plan regarding the sub games. It is important that the teams have at least an initial idea to which direction they are going. The sub games are:

- Demand – supply balancing game;
- Cellular radio game (WCDMA vs. EDGE);
- Multi-radio game (cellular data vs. WLAN data);
- Pricing game (flat rate vs. usage based vs. block pricing);
- Charging game (prepaid vs. postpaid);
- Messaging game (SMS vs. MMS);
- Roaming game (bilateral vs. clustered) (Not implemented yet!);
- Mobile content game (operator charging vs. bit pipe) (Not implemented yet!);
- Handset and MVNO games (Not implemented yet!).

The **Demand-supply balancing game** is the top-level game. The teams see some indications of demand of the services they are selling and they must try to supply to this demand. Essential elements of this type of game are the estimation of demand and relevant preparations for equipment capacity.

The **Cellular radio game** is a technology sub game. Teams must fulfill the emerging need for more capacity in cellular data services by developing knowledge and purchasing equipment of third generation radio access and trunk technologies. Two possibilities for third generation access networks are presented in MOB, the first is EDGE and the second is WCDMA.

The **Multi-radio game** is other type of radio technology game. Cellular radio technologies are challenged by other emerging technologies. In this version of MOB only

WLAN is included. Teams must ponder the positioning on WLAN technologies. Will WLAN be a strong competitor of cellular technologies or will its role be more of a contributing extension of cellular technologies for bandwidth intensive services?

In the **Pricing game** teams have to decide on their pricing schemes. For simplicity, different pricing schemes are available only in the pricing of consumer data services. Players can choose between usage based pricing, flat rate pricing and a sort of block pricing (more on this in chapter 2). The basic assumption in this sub game is that consumers do not like meters and there for prefer flat rate. Flat rate on the other hand is not appealing choice for the operators because with flat rate pricing it is very difficult to predict the overall transmitted traffic.

The **Charging game** deals with timing of charging. There are two charging schemes for consumer customers: prepaid and postpaid. Prepaid charging has had significant importance in many countries in increasing the cellular penetration rate when saturation of postpaid users has started to emerge. Prepaid has traditionally been an attempt to get the less profitable customers. Customers belonging to this segment can for example be customers that aren't credit worthy. If a customer isn't credit worthy it does not necessarily mean that he is a bad customer. For example young people fall into category of non-credit worthy and still they are seen as a very important customer group.

The same kinds of assumptions can be made for the other sub games that were mentioned (messaging game, roaming game etc.).

1.2.6 Demand in MOB

Demands for different services follow the commonly known market life cycles (Kotler, 1997). A separate life cycle curve is defined for each offered service: i.e. pre- and postpaid voice, cellular data, WLAN data, SMS and MMS.

Demand is defined in three levels. First there is the population of the imaginary country. Usually during a game session growth of population is small and linear. Second level is the number of voice subscriptions (pre- and postpaid). The life cycle of these subscriptions is essentially the same as the life cycle of mobile communications, which within the scope of the game is always either in growth stage or maturity stage. On the third level there are the market life cycles of other services that are handled as additions to the voice subscription. The upper levels can be seen as the upper bounds of demand. Number of subscriptions cannot radically exceed the number of population and subscribers of a particular service cannot exceed the number of subscriptions.

Market life cycles are implemented in two different ways. First there are the static life cycle curves that are defined by the facilitator before a game session. These curves are defined by giving them an initial demand value for season 0 and then giving them growth

rates for each season. The facilitator can manually adjust the growth rates during the game if needed.

Static demand curves are used for services that have already been introduced and are in commercial use at the beginning of the game. These demand curves do not have any technological obstacles that players have to tackle before the service can be offered in its full capacity either. These services are prepaid and postpaid voice, GPRS, SMS, and MMS.

On the other hand there are services that are not in commercial use at the beginning of the game and are dependent of the technological choices of the participants. For example data services via EDGE or WCDMA networks enable a much richer service portfolio than data services via the GSM/GPRS network. For these kinds of services static demand curves are not desirable. Participants' actions have an impact on the demand and it must be shown. A more dynamic approach is used for such services. The dynamic demand curves are calculated separately for every season. Services with dynamic demand curves are EDGE, UMTS, and WLAN.

2. The Player Module in MOB

The windows where the teams put their decisions are explained in this chapter. All the decisions that are needed to play MOB will be described shortly. This chapter is largely based on the Master's Thesis by J. Kokko (Kokko, 2004).

The white cells in MOB are for actual decisions, the gray cells for estimations, and the others for automated revenue calculations, previous years' values, and other information. The estimation cells makes it possible to make what if analysis and to make estimations for next years cash flow and income statements, and balance sheets.

Every window has the same buttons at the top of the page. These buttons are:

- The Main –button;
- The Offers for Consumers –button;
- The Offers for Corporations –button;
- The Offers for Content Providers –button;
- The Marketing –button;
- The Research and Development –button;
- The Roaming, MVNO, & Handsets –button;
- The Network Maintenance –button;
- The Purchasing –button;
- The Human Resources –button;
- The Financing & Cash Flow Statement –button;
- The Income Statement & Balance Sheet –button.

Every one of these buttons represents a window in MOB. Some of these buttons may have sub buttons if the window is divided in several sub windows.

2.1 The Main Window

The main window has only two functions for the players. To get the new results generated by the facilitator between each season, and to save and send the decisions made by the teams to the facilitator. The main window also shows the name of the team, the team number, and the current season. The main window can be seen in figure 3.

Figure 3: *The Main window of MOB.*

2.2 The Offers for Consumers Window

2.2.1 Voice Services

Voice traffic is priced in the same manner that mobile operators have traditionally priced it. All teams will have the same pricing scheme. It is recommended that teams examine carefully their cost structure and estimate some kind of value for the lowest prices they can offer and still be profitable. Teams should also estimate the highest prices the customers are willing to pay. As in real life neither of these values is likely to be same between any two groups of players.

From figure 4 it can be seen that the values in dark blue are values from the previous season. This information is important when making new decisions and estimating possible revenues for the season to come.

Figure 4: *The Offers for Consumers: Voice Services window in MOB.*

2.2.2 Data Services

In data services teams have an additional opportunity to differentiate and compete with the actual pricing scheme (pricing type). The teams have three choices to choose from. Each of these choices has their own pros and cons. The first alternative is usage-based pricing, which is basically identical to the pricing scheme used for voice traffic. With this scheme traffic is measured constantly. Second pricing scheme is flat rate pricing. In this scheme customers pay a monthly fee, which gives them permission to use as much network resources as they choose. If the team chooses this pricing scheme it should be

prepared for careless usage of network resources. The third pricing scheme is sort of a block pricing scheme. This is a combination of usage-based pricing and flat rate pricing. The idea is that a customer pays a monthly fee for a block of data and if he uses more he also pays usage-based fee for every additional data unit (compare to the GPRS pricing schemes of today's mobile operators).

The offers are divided into cellular data and WLAN data. Cellular data means GPRS, EDGE, and/ or UMTS. The pricing schemes are the same for both, i.e. if the player chooses flat rate, both cellular and WLAN data uses flat rate. From figure 5, the offers for consumer data services can be seen.
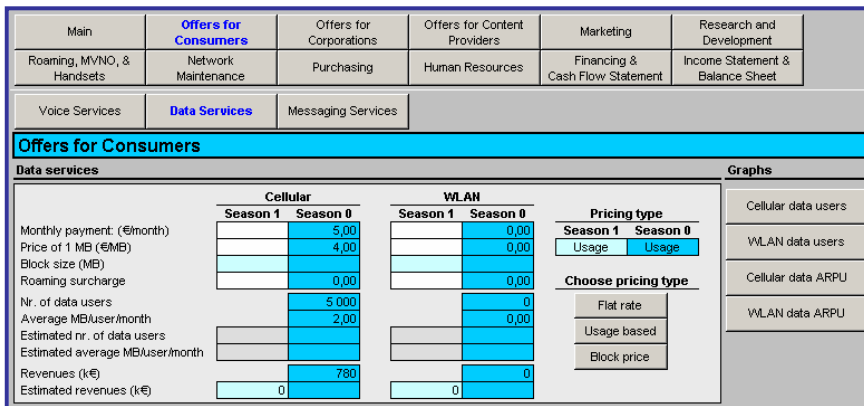

Figure 5: *The Offers for Consumers: Data Services window in MOB.*

2.2.3 Messaging Services

The last consumer related pricing decisions are for pricing messaging services. Players have to set prices for SMS and MMS messages. SMS market is considered to be a mature market. MMS on the other hand is a growing market where demand starts from zero and gradually grows during the game. MMS might partly satisfy the same needs as SMS. As demand for MMS grows there is likely to be a decline in the demand of SMS, though MMS will never fully replace SMS. The offers for consumer massaging services can be seen from figure 6.

Figure 6: *The Offers for Consumers: Messaging Services window in MOB.*

2.3 The Offers for Corporations Window

The corporate customers are divided into three segments according to their size. The segments are: small and medium sized enterprises (SME), national corporations (NAT) and international corporations (INT). An additional fourth segment is the public administration (PA). Decisions concerning public administration are the same as in corporate segments but the pricing rules are different. Generally profits in public administration are smaller than in corporate segments.

Teams can make offers to each of the previously mentioned segments. For simplicity, offers are made as monthly flat rate charge per person. Following segment specific information helps in decision-making:

- Average number of personnel;

- Number of corporations;

- Previous average monthly call minutes per user;

- Previous average monthly data traffic (MB) per user

The Offers for Corporations window is shown in figure 7. The resource usage of each segment can be calculated from average number of personnel, number of current customers, estimations of new customers and estimated average monthly call minutes/data traffic per user. From resource usage the teams can calculate the cost of these customers. This information can be used as the minimum price offer. For the actual offer teams have to consider the general price level between all competitors and their investment on customer relationships. If teams have invested enough in customer relationship in the long term, customers might see their offer more valuable than a cheaper offer by some competitor who has not invested in customer relationship. Investment in customer relationship is the equivalent of marketing investment on the

consumer side. In corporate side the marketing is done individually to each customer. In addition to previous decisions teams can try to acquire new customers. The acquisition of a new customer is approximately five times more expensive than retaining an old one.

Figure 7: *The Offers for Corporations window in MOB.*

From the Offers for Corporations window, the teams can directly see both the estimated revenues from the corporate segments and the direct expenses of corporate deals. Indirect corporate expenses such as personnel, equipment and administrative expenses are considered elsewhere. Players should be efficient in their investments. Too small investments will not produce the wanted revenue and thus can be considered as wasted capital. Too large investments will not produce any more revenues than investments of the right size, and again money is wasted. Last thing that should be kept in mind is that customer relationship management is a continuous long-term investment.

2.4 The Offers for Content Providers Window

Currently not implemented in MOB!

2.5 The Marketing Window

Marketing decisions are divided into three different service categories: voice, data and content (content not implemented yet!). The decisions are made using a top down approach. First teams decide the size of their marketing budget. Then the budget is divided between the service categories. When each service category has its part of the whole budget the marketing messages are targeted. The Marketing window can be seen in figure 8.

Main	Offers for Consumers	Offers for Corporations	Offers for Content Providers	**Marketing**	Research and Development	
Roaming, MVNO, & Handsets	Network Maintenance	Purchasing	Human Resources	Financing & Cash Flow Statement	Income Statement & Balance Sheet	

Marketing

Marketing

	Investment				Graphs
	Season 1	Season 0			
Marketing investments:		80 000	k€		Marketing investments: Voice
Effort on voice:	70	85	%		Marketing investments: Data
Effort on data:	30	15	%		Marketing investments: Content
Effort on content:	0	0	%		
Total:	100	100	%		

Segment allocation of advertising message:	Voice (%)		Data (%)		Content (%)	
	Season 1	Season 0	Season 1	Season 0	Season 1	Season 0
Innovators:	0	0 %	45	80 %	100	100 %
Early adopters:	0	0 %	40	20 %	0	0 %
Majority:	50	90 %	15	0 %	0	0 %
Laggards:	50	10 %	0	0 %	0	0 %
Total:	100	100 %	100	100 %	100	100 %

Marketing info

Season	0	1	2	3	4	5	6	7	8	9
Successful voice investment (k€):	85,00									
Image multiplier for voice:	1,15									
Successful data investment (k€):	50,00									
Image multiplier for data:	1,29									
Successful content investment (k€):	85,00									
Image multiplier for content:	1,15									

Figure 8: *The Marketing window in MOB.*

The consumer customers are divided into four segments and all the segments have their own characteristics and sizes. The segments and their sizes as a percentage of the whole consumer customer population are presented in the following list:

- Innovators 2.5%;
- Early adopters 13.5%;
- Maturity 68%;
- Laggards 16%.

2.6 The Research and Development Window

In the Research and Development window (figure 9) teams must make decisions regarding their research and development investments on different technologies. Only radio access technologies and application and service platforms are included in the currently version of MOB. Teams must decide the technologies they will invest in and how they will distribute their investments. The investments can be distributed into three segments; research, standardization, and testing.

The research segment will raise operator's knowledge level about a certain technology. This will improve operator's competence to operate the technology. Investments into the testing segment will ensure the quality of service. Investing into the standardization segment is a common effort of all teams in the game. None of the new technologies can be taken into use before enough is invested into standardization. When enough investments are made into a certain technology, that technology is considered to be mature enough to be taken into use. When this happens all teams that have enough knowledge to operate the new technology can start buying the equipment and offering the services enabled by that technology.

The research and development info indexes need to reach a level of 1 to enable the teams to use a certain technology. The levels are from 1 to 3. A level of 1 equals good knowledge, a level of 2 equals very good knowledge, and a level of 3 equals superior knowledge. The higher the level, the more competitive is the team. To reach a level of 1 can be fairly easy, but reaching higher levels requires much more investments.

Main	Offers for Consumers	Offers for Corporations	Offers for Content Providers	Marketing	Research and Development	
Roaming, MVNO, & Handsets	Network Maintenance	Purchasing	Human Resources	Financing & Cash Flow Statement	Income Statement & Balance Sheet	

Research and Development

Research and Development

Technologies:	Investment (k€)		Research (%)		Testing (%)		Standardisation (%)			
	Season 1	Season 0	Season 1	Season 0	Season 1	Season 0	Season 1	Season 0		
GSM		80 000	40	40	30	30	30	30		OK
GPRS		20 000	40	40	30	30	30	30		OK
EDGE		0	40	0	30	0	30	0		OK
WCDMA		0	35	0	35	0	30	0		OK
WLAN		0	35	0	35	0	30	0		OK
Application & service platforms		5 000	30	40	30	30	40	30		OK

Research and Development Info

Season	0	1	2	3	4	5	6	7	8	9
GSM	2									
GPRS	1									
EDGE	0									
WCDMA	0									
WLAN	0									
Application & sevice platforms	1									

Graphs: Investments on R&D

Investment on GSM	Investment on GPRS	Investment on EDGE	Investment on WCDMA	Investment on WLAN	Investment on application & serv.

Figure 9: *The Research and Development window in MOB.*

2.7 The Roaming, MVNO, and Handsets Window

2.7.1 Roaming

Currently not implemented in MOB!

2.7.2 MVNO

Currently not implemented in MOB!

2.7.3 Handsets

Currently not implemented in MOB!

2.8 The Network Maintenance Window

The network maintenance window is as much an information window, as it is a decision window. Here players can see the capacity, general condition and usage-level of their network equipment (figure 10). The Network Maintenance window divides the network equipment into three logical entities: access networks, core networks, and supplementary equipment. This kind of division is derived from 3GPP specifications (3GPP specifications; Nokia home pages).

Main	Offers for Consumers	Offers for Corporations	Offers for Content Providers	Marketing	Research and Development
Roaming, MVNO, & Handsets	**Network Maintenance**	Purchasing	Human Resources	Financing & Cash Flow Statement	Income Statement & Balance Sheet

Network Maintenance

Access networks

Equipment	National coverage (%)	Capacity (simult. users)	General condition (%)	Usage-level (%)	Season 0 Investment on maint. (k€)	Season 1 Investment on maint. (k€)	Graphs
GSM	NW	600 000	95,00	70,00	500		Previous investments on GSM/GPRS
GPRS	NW	3 000	95,00	70,00	200		Previous investments on EDGE
EDGE	NW	0	0,00	0,00	0		Previous investments on WCDMA
WCDMA	NW	0	0,00	0,00	0		Previous investments on WLAN
WLAN (public indoor)	NW	0	0,00	0,00	0		

Core network

Equipment	Capacity (simult. users)	General condition (%)	Usage-level (%)	Season 0 Investment on maint. (k€)	Season 1 Investment on maint. (k€)	Graphs
CS core	600 000	95,00	70,00	500		Previous investments on CS core
PS core	3 000	95,00	70,00	200		Previous investments on PS core

Supplementary equipment

Equipment	Capacity (simult. users)	General condition (%)	Usage-level (%)	Season 0 Investment on maint. (k€)	Season 1 Investment on maint. (k€)	Graphs
Middleware & service platforms	500 000	95,00	70,00	100		Previous investments on Middleware & serv.
Billing and charging systems	600 000	95,00	70,00	100		Previous investments on billing and char.
HLR (# of subscribers)	2 500 000	95,00	70,00	100		Previous investments on HLR

Development of quality indexes

Season	0	1	2	3	4
Voice	1,1				
Data	1,1				
Messaging	1,1				
Season	5	6	7	8	9
Voice					
Data					
Messaging					

Figure 10: The Network Maintenance window in MOB.

The decisions players have to make in this window are related to the general condition of the network equipment. Players need to decide the financial effort that they will invest on maintenance of the equipment. When new technologies and services are taken in use, the network equipment experiences a shake down period before the new service or technology is working properly. This period lasts roughly one season and during this time the usage level of the network should get very high. A good rule of thumb is that a good usage-level is about 70% of the theoretical maximum. If maintenance is done properly the fault conditions of the network are kept at minimum.

The general condition of network elements and usage-levels tell the level of quality delivered to customers. If customers receive services with poor quality they are willing to pay less for the service and they are also more willing to change to another operator.

In addition to maintenance information, the Network Maintenance window gives information for needed purchase decisions. Teams should always watch that the capacities of their network equipment are sufficient to serve all their customers.

2.9 The Purchasing Window

The equipment that is needed for delivering services is purchased through the purchasing window. An important issue regarding the purchasing decisions is the estimation of future capacities and the timing of the purchases. The role of purchasing

and also maintenance decisions is emphasized when new technologies are acquired for the first time. Thus special attention should be given to purchasing and maintenance decisions in the introduction stage of new services. In the introduction stage sales grow slowly. Possible reasons might be (Buzzell, 1956):

- Delays in expansion of production capacity;
- Technical problems;
- Delays in setting up distribution;
- Customer reluctance to change.

Although these results are derived from manufacturing industry and they are almost half of a century old, most of them are relevant for mobile operators today. If mobile operator is launching a service that requires new radio network the first problem is coverage. Operator needs to rapidly build coverage so that the new service can be distributed to all customers. New services require new technologies and modifications to old technologies, which inevitably lead to shake down periods with numerous technical problems whenever new services are introduced. All of these problems have to be tackled so that the customers believe that the service is actually working and not in a trial stage. Capacity problems are usually not very serious in the introduction stage. Operator equipment purchases are usually done as long term investments and the capacity that is purchased is supposed be sufficient for several years into the future. This is especially true for the access network. The installation of more capacity than actually needed can often be justified, so that there is capacity that could last for several years. Capacity will become an issue when the growth stage starts though.

The EDGE, UMTS, and WLAN equipment is not visible from beginning of the game (figure 11). These will become visible when the teams are ready for the technology, i.e. when the research and development info indexes are set to, at least the level of 1.

Figure 11: *The Purchasing window in MOB.*

2.10 The Human Resources Window

Human resources management is conducted with following two parameters: increase/ decrease in personnel and investment on personnel development. The employees are divided in to three categories: marketing, customer service, and research and development personnel. The modeling of human resources management is made very simple in MOB. Figure 12 shows the user interface of the Human Resources window.

Figure 12: *The Human Resources window in MOB.*

2.11 The Financing and Cash Flow Statement Window

Currently not implemented in MOB!

2.12 The Income Statement and Balance Sheet Window

Under the Income Statement & Balance Sheet button, there are 4 sub windows. These are: the Budgeted Income Statement, the Income Statement: Previous Years, the Budgeted Balance Sheet, and the Balance Sheets: Previous Years windows. In this chapter only the Budgeted Income Statement and the Budgeted Balance Sheet windows are presented.

2.12.1 Budgeted Income Statement

In the Budgeted Income Statement window, the budgeted income statement for the current and the previous season are shown (figure 13). The revenues are divided into nine parts: consumer postpaid voice revenues, consumer prepaid voice revenues, consumer data revenues, consumer SMS revenues, consumer MMS revenues, corporate voice revenues, corporate data revenues, revenues from content, and revenues from roaming customers (the last two not implemented in the current version of MOB!).

Figure 13: *The Budgeted Income Statement window in MOB.*

The cost side again is divided into eight categories: marketing expenses, maintenance expenses, purchasing expenses, corporate customer acquisition expenses, corporate customer relations expenses, personnel expenses, research and development expenses, and other expenses.

The financial expenses consist of the interest paid for the short and long term dept that the team has taken and the tax rate is 29%.

2.12.2 Budgeted Balance Sheet

The balance sheet is a very simplified version of a company's balance sheet. The assets are divided into fixed assets and into cash and cash equivalents. Then we have the liabilities and the equity. The equity is divided into share capital, previous year profits, and profits for this year. The liabilities are divided into short term and long term dept. In the MOB model, there are no dividends paid.

Main	Offers for Consumers	Offers for Corporations	Offers for Content Providers	Marketing	Research and Development
Roaming, MVNO, & Handsets	Network Maintenance	Purchasing	Human Resources	Financing & Cash Flow Statement	**Income Statement & Balance Sheet**

Budgeted Income Statement	Income Statements: Previous Years	**Budgeted Balance sheet**	Balance sheets: Previous Years

Budgeted Balance Sheet

Budgeted balance sheet (k€)	Season 1	Season 0

Assets

	Season 1	Season 0
Fixed assets		
Cash and cash equivalents		
Total		

Liabilities & equity

Equity

	Season 1	Season 0
Share capital		
Previous years profits		
Profits for this year		
Total equity		

Liabilities

	Season 1	Season 0
Short term dept		
Long term dept		
Total liabilities		
Total		

Figure 14: The Budgeted Balance Sheet window in MOB.

3. Scenario Description

In this chapter a short presentation of the scenario of the market in the MOB model is described. The team represents a management team of one of the mobile operators in a small European EU-member country.

Because of the way a business game is used in teaching, it is very important that all the teams stick to the schedules that will be given during the actual session. If the teams are not able to do so, a penalty will be given to the team in question. The penalty is in a form of lost money in MOB and is decided by the facilitator.

3.1 General

The country where the teams operate in is democratic and promotes the development of the information society in the country. The market development is based on actions made by the private companies which must follow the prevailing law of communications market and the competition. For instance cartels and price agreements are not allowed between companies. If this would happen, the companies involved would be punished by local authority.

The population of the country is at the beginning of game (season 0) at 5200000. The population is expected to grow for many years to come. The growth rate is estimated to be approximately 0,15 - 0,25 percent per year.

The economy in the country is steady and quite healthy and the inflation is currently on a reasonable level at 2 percent. According to market analysts, this situation will continue also in the long run. Also interest rates are at a low level, currently ranging between 3-5 percent. The interest rate level will not see any drastic movement in the forthcoming years, at least according to some analysts.

3.2 The Mobile Communications Market

Every mobile operator which operates in the country is classified as an actor with significant market power (SMP). Supervision of the mobile communications market is done by the country's Communications Regulatory Authority (CORA). The most important tasks of CORA are to promote competition and to prevent anti-competitive behavior of SMP's.

The penetration rate of mobile voice subscriptions is currently 80,8 percent of the population, i.e. it is close to saturation. But, the penetration rate is still expected to grow. The estimation for the subscription growth rate for next season is at 7 percent. According to consultants, voice will remain as a cash cow for many years to come. The outlook for the growth in the subscription rate for the incoming 6 years is as follows:

Table 1: *The estimated growth rate in subscriptions and penetration rate.*

Season	1	2	3	4	5	6
Subs growth rate	6%	3%	1%	0,4%	0,3%	0,2%
Penetration rate	85,4%	90,4%	92,9%	93,7%	93,8%	93,9%

The amount of consumer subscriptions out of all the subscriptions is approximately 70 percent. The country's consumer customers have traditionally been quite focused on postpaid voice subscriptions, but according to some research this is going to change in the future. Currently 95 percent of the consumer voice subscriptions are postpaid. In five years this number is estimated to drop to about 87 percent.

Cellular data is currently in a situation where it is getting more and more popular. In the beginning GPRS is the only packet based data technology in use, but depending on the operators, EDGE and UMTS will emerge during the next few years. The number of cellular data users in the beginning of the game is low (approximately 30000). 65 percent of these are consumers and 35 percent corporate users. The cellular data growth rate will heavily depend on the operators' actions, but according to some estimates it could be as large as 300 percent during the first few seasons. The same assumptions can be made for the WLAN technology. A thing to remember is that the consumers' capability to exploit new services grows continuously.

SMS has traditionally been a very important service for the operators. Some studies have been made which indicate that SMS will slightly grow for a few years to come, but MMS will gradually replace SMS traffic. The estimated evolution of SMS and MMS users can be seen from figure 15 and 16. The MMS usage is at the beginning of the game growing by approximately 250 percent. During the fifth season the growth will declined to about 150 percent, i.e. the total amount of MMS users will then be, according to the estimates, approximately 1700000.
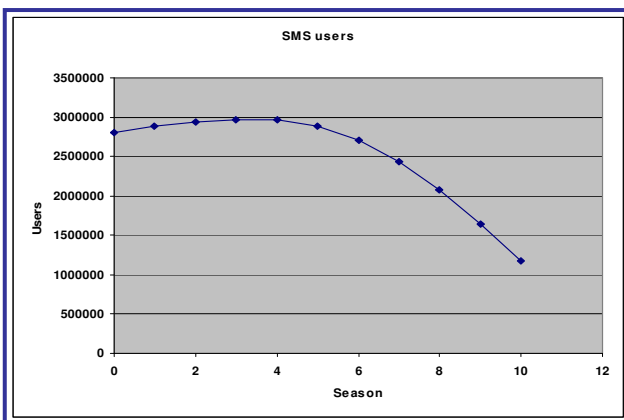

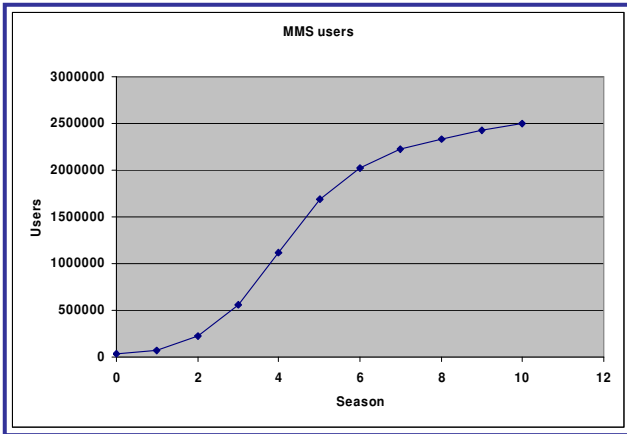**Figure 15:** *The estimated evolution of SMS.*

Figure 16: *The estimated evolution of MMS.*

4. The First Season

In the beginning of the game all the teams have the same starting position. The history information is the same for all the teams. This includes the numbers in the income statement, the numbers in the balance sheet, previous year investments, amount of subscribers etc. This means that if someone were to make a SWOT analysis of the operators, the main differences between these analyses would be in the actual management teams and the strategy/ strategies that was/ were chosen by the management team.

List of References

3GPP specifications, http://www.3gpp.org/.

Buzzell, R. D. (1956). Competitive Behavioral and Product Life Cycles, in New Ideas for Successful Marketing.

Faria, A. J. (1987). Survey of the Use of Business Games in Academica and Business, Simulation and Gaming Vol. 18:2.

Faria, A. J. (1998). Business Simulation Games Current Usage Levels – An Update, Simulation & Gaming Vol. 29:3.

Kokko, J. (2004). Mobile Operator Business Game, Helsinki University of Technology, Master's Thesis.

Kotler, P. (1997). Marketing Management, 9th edition, Prentice Hall.

Nokia home pages, http://www.nokia.com/.

Töyli, J. (2001). A Generic Business Management Simulation for Graduate Student and Managerial Training, Turku School of Economics and Business Administration, Doctoral Thesis.